Journal of Non-Crystalline Solids 145 (1992) ix–xi
North-Holland

Contents

Preface vii
Contents ix

Precursors for aerogels
R.C. Mehrotra 1
Sol–gel chemistry
J. Livage and C. Sanchez 11
A model for viscosity in the early stages of the sol–gel transformation
W. Vogelsberger, J. Opfermann, U. Wank, H. Schulze and G. Rudakoff 20
Physicochemical transformation of silica gels during hypercritical drying
T. Woignier, J. Phalippou, J.F. Quinson, M. Pauthe and F. Laveissiere 25
Stress development during supercritical drying
G.W. Scherer 33
Development and processing of aerogels in a windowed autoclave
J.M. Moses, R.J. Willey and S. Rouanet 41
Transparent ultralow-density silica aerogels prepared by a two-step sol–gel process
T.M. Tillotson and L.W. Hrubesh 44
Preparation of V_2O_5 aerogels and aerogel coatings
H. Hirashima and K. Sudoh 51
Synthesis and characterization of mullite aerogels
T. Heinrich, F. Raether, W. Tappert and J. Fricke 55
Mixed silica–iron oxide aerogels
M. Soufyani, D. Bourret, A. Sivade and R. Sempéré 60
Colloidal vs. polymeric aerogels: structure and vibrational modes
J. Pelous, M. Foret and R. Vacher 63
Phase separation during isothermal sintering of $(1-x)SiO_2$–xLn_2O_3 aerogels
J. Bouaziz, D. Bourret, A. Sivade and C. Grill 71
Nano-structured silica from rice husk
R. Conradt, P. Pimkhaokham and U. Leela-Adisorn 75
Modification of nanometer range pores in silica gels with interconnected macropores by solvent exchange
H. Kaji, K. Nakanishi, N. Soga and F. Horii 80
Hydrophobic aerogels from $Si(OMe)_4/MeSi(OMe)_3$ mixtures
F. Schwertfeger, W. Glaubitt and U. Schubert 85
Aerogels derived from multifunctional organic monomers
R.W. Pekala, C.T. Alviso, F.M. Kong and S.S. Hulsey 90
Ammoniation and nitridation of highly disperse silica
P. Fink, B. Müller and G. Rudakoff 99

0022-3093/92/$05.00 © 1992 – Elsevier Science Publishers B.V. All rights reserved

Structure and topology of silica aerogels
D.W. Schaefer, B.J. Olivier, C.S. Ashley, D. Richter, B. Farago, B. Frick, L. Hrubesh, M.J. van Bommel, G. Long and S. Krueger 105

Small angle scattering and the structure of aerogels
A. Emmerling and J. Fricke 113

Inelastic neutron scattering from virgin and densified aerogels
U. Buchenau, M. Monkenbusch, G. Reichenauer and B. Frick 121

A SANS investigation on absolute scale of a homologous series of base-catalysed silica aerogels
D. Posselt, J.S. Pedersen and K. Mortensen 128

SANS and SAXS investigations of silica aerogels: crossover from fractal structure to short-range packing
M. Foret, J. Pelous, R. Vacher and J. Marignan 133

Effective medium approximation for vibrational excitations in disordered solids
M. Wagener and W. Schirmacher 136

Optical investigations of silica aerogels
P. Wang, W. Körner, A. Emmerling, A. Beck, J. Kuhn and J. Fricke 141

Correlation between low-frequency Raman spectra and the structure of aerogels
A. Chougrani, J.L. Sauvajol, M. Foret, R. Vacher and J. Pelous 146

Spectral hole burning in H_2Pc-doped SiO_2-aerogels
S. Reul, W. Richter and D. Haarer 149

IR spectroscopy of porous silica gels
M. Hornfeck, W. Theiss and R. Clasen 154

Analysis of photoacoustic IR spectra of aerogel and silica powder
H. Hövel, P. Grosse and W. Theiss 159

^{29}Si MAS-NMR investigations of silica aerogels
U. Damrau, H.C. Marsmann, O. Spormann and P. Wang 164

Properties of water adsorbed in porous silica aerogels
A. da Silva, P. Donoso and M.A. Aegerter 168

Structural investigation of the silica–titania gel/glass transition
M. Beghi, P. Chiurlo, L. Costa, M. Palladino and M.F. Pirini 175

Dynamic gas flow measurements on aerogels
C. Stumpf, K. von Gässler, G. Reichenauer and J. Fricke 180

Characterization of the porous texture of aerogel, precipitated and pyrogenic silicas
F. Ehrburger-Dolle, M. Holz, C. Mauzac, J. Lahaye and G.M. Pajonk 185

Theory of thermal conduction in low density materials
P.G. Klemens 191

Thermal properties of silica aerogels between 1.4 and 330 K
P. Scheuerpflug, M. Hauck and J. Fricke 196

Low-temperature specific heat and thermal conductivity of silica aerogels
A. Bernasconi, T. Sleator, D. Posselt, J.K. Kjems and H.R. Ott 202

Thermal transport in organic and opacified silica monolithic aerogels
X. Lu, P. Wang, M.C. Arduini-Schuster, J. Kuhn, D. Büttner, O. Nilsson, U. Heinemann and J. Fricke 207

Heat transfer in opacified aerogel powders
E. Hümmer, X. Lu, T. Rettelbach and J. Fricke 211

Ultrasonic velocity measurements in silica, carbon and organic aerogels
J. Gross and J. Fricke 217

Ultrasonic attenuation in silica aerogels
T. Schlief, J. Gross and J. Fricke 223
Modified SiO_2 aerogels as acoustic impedance matching layers in ultrasonic devices
R. Gerlach, O. Kraus, J. Fricke, P.-C. Eccardt, N. Kroemer and V. Magori 227
Development of aerogel windows
V. Wittwer 233
Passive solar component based on evacuated monolithic silica aerogel
K.I. Jensen 237
Solar collector with monolithic silica aerogel
S. Svendsen 240
Thermal muonium in vacuo from silica aerogels
W. Schwarz, V. Ebert, H. Geerds, K. Jungmann, S. Kirches, S. Koppe, F. Maas, H.-J. Mundinger, G. zu Putlitz, J. Rosenkranz, W. Schäfer, G. Schiff, Z. Zhang, M.G. Boshier and V.W. Hughes 244
Alumina-based aerogels as carriers for automotive palladium catalysts
C. Hoang-Van, B. Pommier, R. Harivololona and P. Pichat 250

Author index 255
Subject index 258